

AI ASSIGNMENT-7.4

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ROLL NO:2503A51L12

Task Description #1:

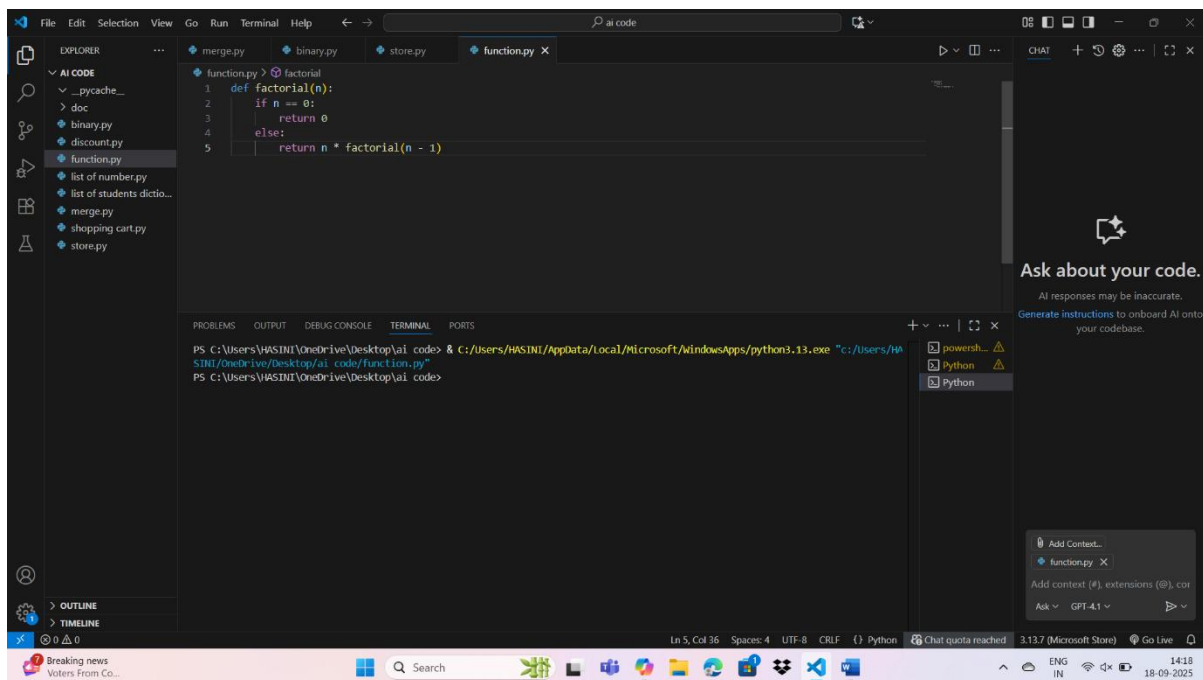
- Introduce a buggy Python function that calculates the factorial of a number using recursion. Use Copilot or Cursor AI to detect and fix the logical or syntax errors.

Expected Outcome #1:

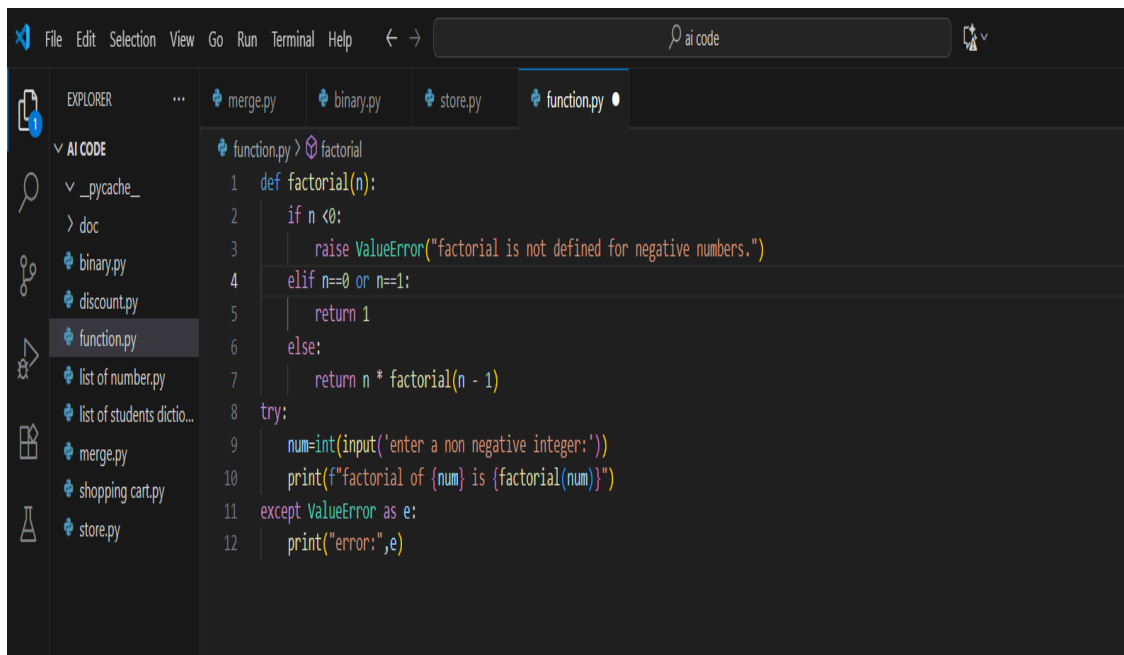
- Copilot or Cursor AI correctly identifies missing base condition or incorrect recursive call and suggests a functional factorial implementation.

OUTPUT:

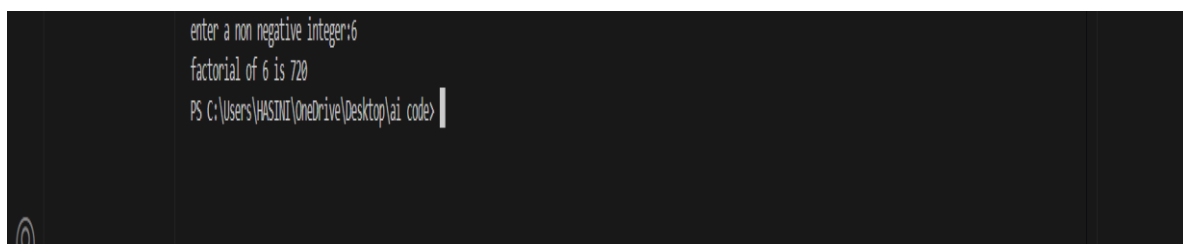
BUGGY CODE:



CORRECTED CODE:



```
1 def factorial(n):
2     if n < 0:
3         raise ValueError("factorial is not defined for negative numbers.")
4     elif n==0 or n==1:
5         return 1
6     else:
7         return n * factorial(n - 1)
8 try:
9     num=int(input('enter a non negative integer:'))
10    print(f"factorial of {num} is {factorial(num)}")
11 except ValueError as e:
12    print("error:",e)
```



```
enter a non negative integer:6
factorial of 6 is 720
PS C:\Users\H4SDINZ\OneDrive\Desktop\ai_code>
```

OBSERVATION: Negative inputs cause infinite recursion and eventually a RecursionError. AI generated a corrected code with error exception which does not allow negative values.

- Returning 0 for $n == 0$ contradicts the mathematical definition of $\text{factorial}(0) = 1$
- **Correct Base Case:** Returns 1 for both 0 and 1, aligning with factorial rules

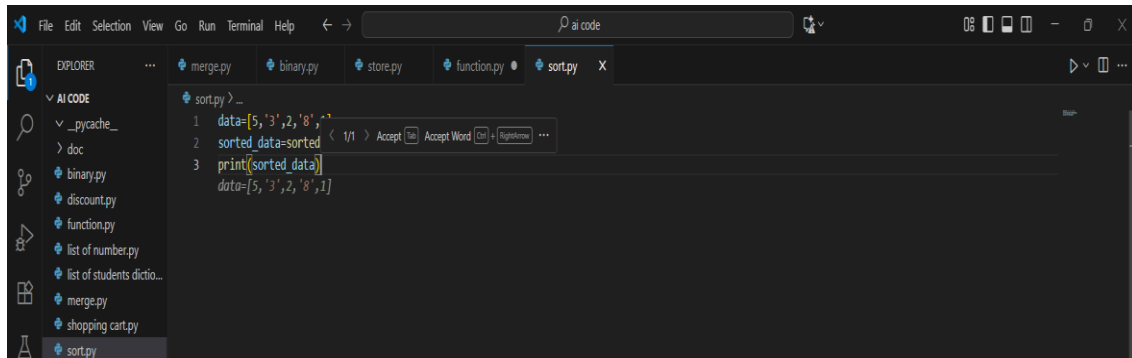
Task Description #2:

• Provide a list sorting function that fails due to a type error (e.g., sorting list with mixed integers and strings). Prompt AI to detect the issue and fix the code for consistent sorting.

Expected Outcome #2:

• AI detects the type inconsistency and either filters or converts list elements, ensuring successful sorting without a crash.

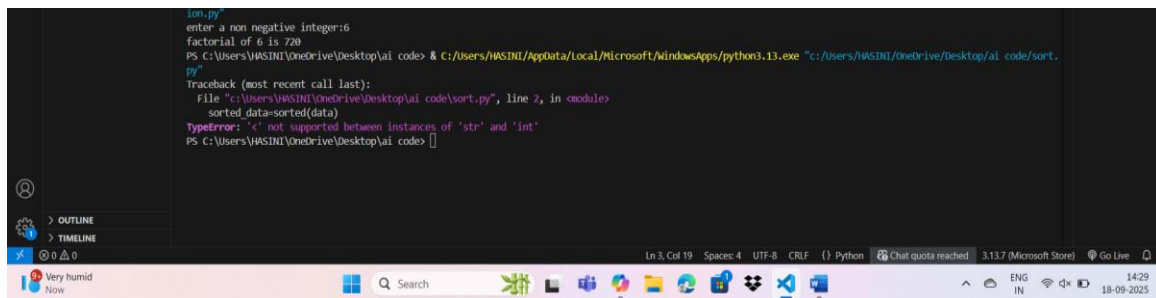
BUGGY CODE:



The screenshot shows the Visual Studio Code editor with a file named `sort.py` open. The code in the editor is as follows:

```
1 data=[5,'3',2,'8','<']
2 sorted_data=sorted
3 print(sorted_data)
   data=[5,'3',2,'8',1]
```

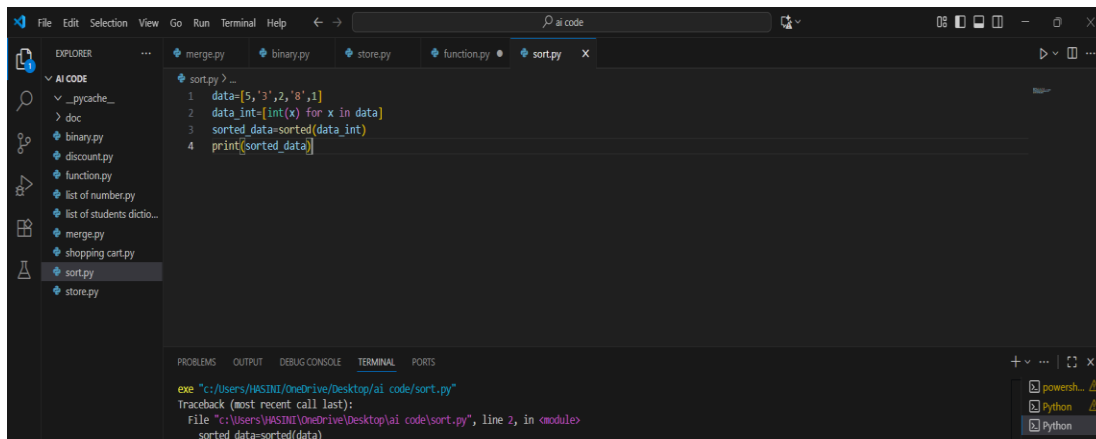
The code contains a list `data` with mixed datatypes (integers and strings) and a string `'<'` which is not a valid Python literal. The file explorer on the left shows a project named `AI CODE` with several other Python files.



The screenshot shows the terminal output of running the `sort.py` file. The command executed is `PS C:\Users\HASINI\OneDrive\Desktop\ai code> & C:/Users/HASINI/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/HASINI/OneDrive/Desktop/ai code/sort.py"`. The output shows a `TypeError` because the `'<'` character is not supported between instances of `'str'` and `'int'`.

```
enter a non negative integer:6
factorial of 6 is 720
PS C:\Users\HASINI\OneDrive\Desktop\ai code> & C:/Users/HASINI/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/HASINI/OneDrive/Desktop/ai code/sort.py"
Traceback (most recent call last):
  File "c:/Users/HASINI/OneDrive/Desktop/ai code/sort.py", line 2, in <module>
    sorted_data=sorted(data)
TypeError: '<' not supported between instances of 'str' and 'int'
PS C:\Users\HASINI\OneDrive\Desktop\ai code> []
```

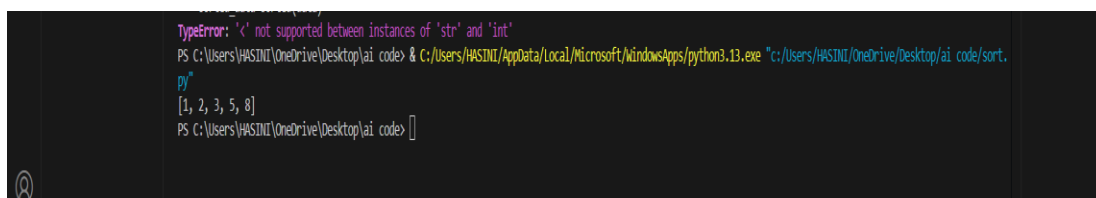
CORRECTED CODE:



The screenshot shows the Visual Studio Code editor with the `sort.py` file. The code has been corrected to use only integers and a valid list syntax:

```
1 data=[5,3,2,8,1]
2 data_int=[int(x) for x in data]
3 sorted_data=sorted(data_int)
4 print(sorted_data)
```

The terminal output shows the command `PS C:\Users\HASINI\OneDrive\Desktop\ai code> & C:/Users/HASINI/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/HASINI/OneDrive/Desktop/ai code/sort.py"` and the output `[1, 2, 3, 5, 8]`.



The screenshot shows the terminal output of running the corrected `sort.py` file. The command executed is `PS C:\Users\HASINI\OneDrive\Desktop\ai code> & C:/Users/HASINI/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/HASINI/OneDrive/Desktop/ai code/sort.py"`. The output shows the sorted list `[1, 2, 3, 5, 8]`.

```
TypeError: '<' not supported between instances of 'str' and 'int'
PS C:\Users\HASINI\OneDrive\Desktop\ai code> & C:/Users/HASINI/AppData/Local/Microsoft/WindowsApps/python3.13.exe "c:/Users/HASINI/OneDrive/Desktop/ai code/sort.py"
[1, 2, 3, 5, 8]
PS C:\Users\HASINI\OneDrive\Desktop\ai code> []
```

OBSERVATION: Mixed datatypes are given as input. AI has converted them into one datatype and sorted the data.

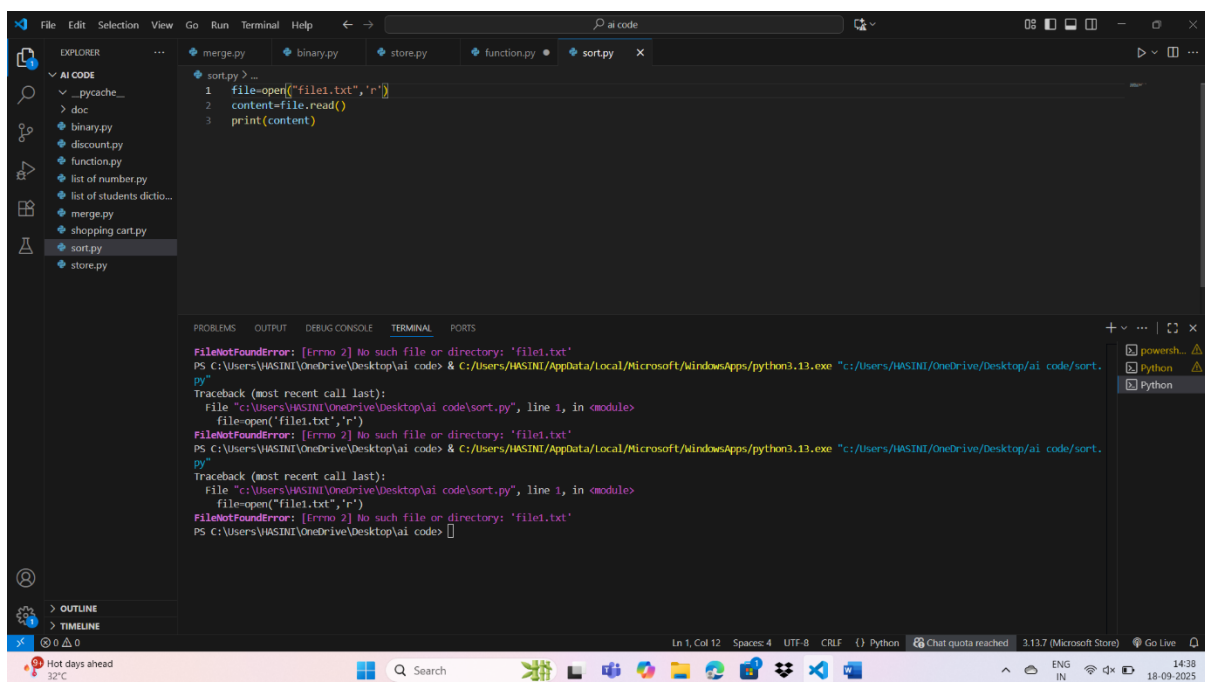
Task Description #3:

- Write a Python snippet for file handling that opens a file but forgets to close it. Ask Copilot or Cursor AI to improve it using the best practice (e.g., with `open()` block).

Expected Outcome #3:

- AI refactors the code to use a context manager, preventing resource leakage and runtime warnings.

BUGGY CODE:



```
FileNotFoundError: [Errno 2] No such file or directory: 'file1.txt'
PS C:\Users\VASINI\OneDrive\Desktop\ai code> & C:/Users/VASINI/AppData/Local/Microsoft/WindowsApps/python3.13.exe "C:/Users/VASINI/OneDrive/Desktop/ai code/sort.py"
Traceback (most recent call last):
  File "C:/Users/VASINI/OneDrive/Desktop/ai code/sort.py", line 1, in <module>
    file=open('file1.txt','r')
FileNotFoundError: [Errno 2] No such file or directory: 'file1.txt'
PS C:\Users\VASINI\OneDrive\Desktop\ai code> & C:/Users/VASINI/AppData/Local/Microsoft/WindowsApps/python3.13.exe "C:/Users/VASINI/OneDrive/Desktop/ai code/sort.py"
Traceback (most recent call last):
  File "C:/Users/VASINI/OneDrive/Desktop/ai code/sort.py", line 1, in <module>
    file=open('file1.txt','r')
FileNotFoundError: [Errno 2] No such file or directory: 'file1.txt'
PS C:\Users\VASINI\OneDrive\Desktop\ai code>
```

CORRECTED CODE:

```
# Safely open and read the file
with open("file1.txt", "r") as file:
    content = file.read()

print(content)
```

```
PS C:\today> c::; cd 'c:\today'; & 'c:\Program Files\Python313\python.exe' 'c:\Users\ADHARSH\.vscode\extensions\ms-python.debugpy-2025.10.0-win32-x64\bundled\libs\debugpy\launcher' '53058' '--' 'c:\today\seven-3.py'  
print("hello world")  
print("this is me")hello widget
```

OBSERVATION:

The `file.close()` is missing so, file remains open after reading, which can:

Leak system resources, Lock the file (especially on Windows),

Trigger runtime warnings or errors in larger applications

No Exception Handling: If the file doesn't exist or can't be read, the code will crash without a fallback.

Using a Context Manager (with open):

Automatically closes the file when the block exits—even if an error occurs

Prevents resource leakage and improves reliability.

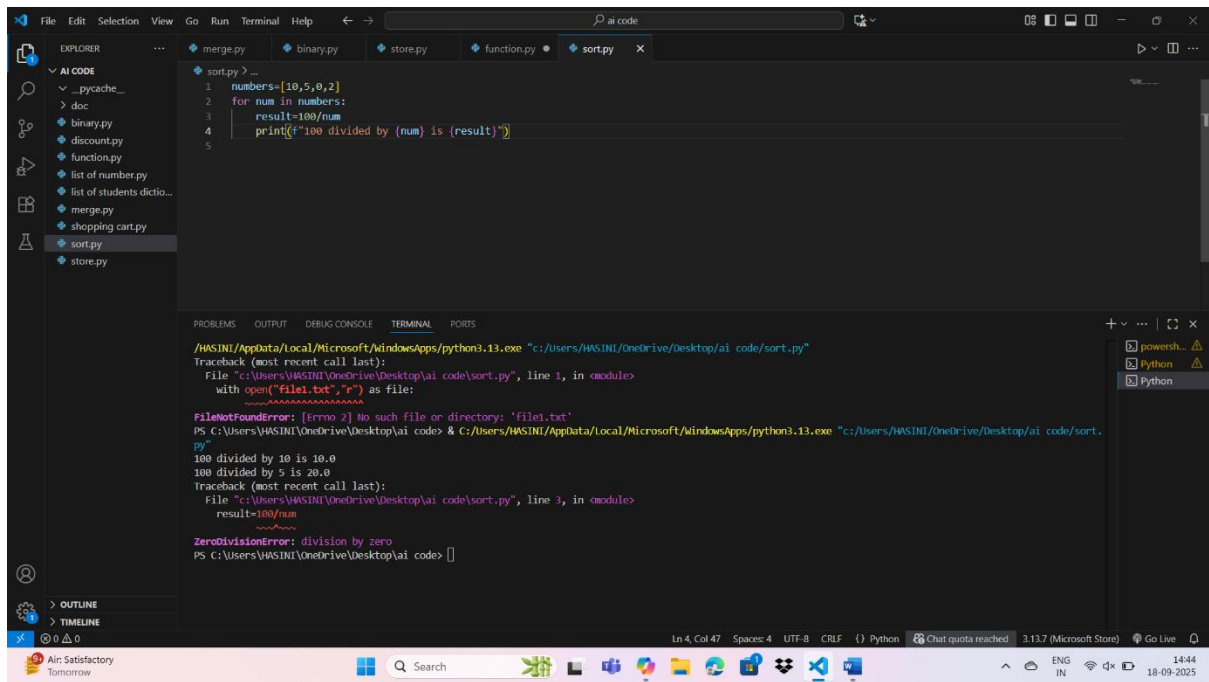
Task Description #4:

- Provide a piece of code with a `ZeroDivisionError` inside a loop. Ask AI to add error handling using `try-except` and continue execution safely.

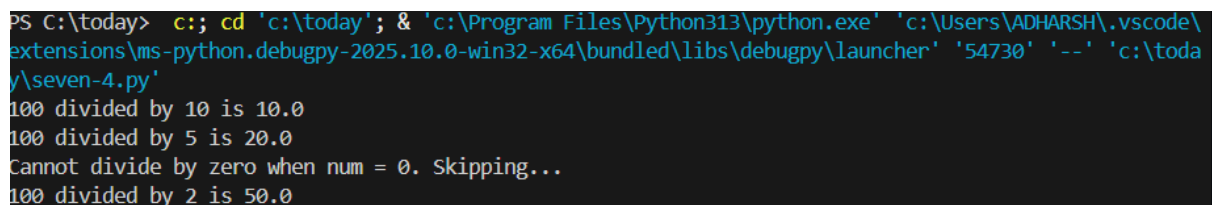
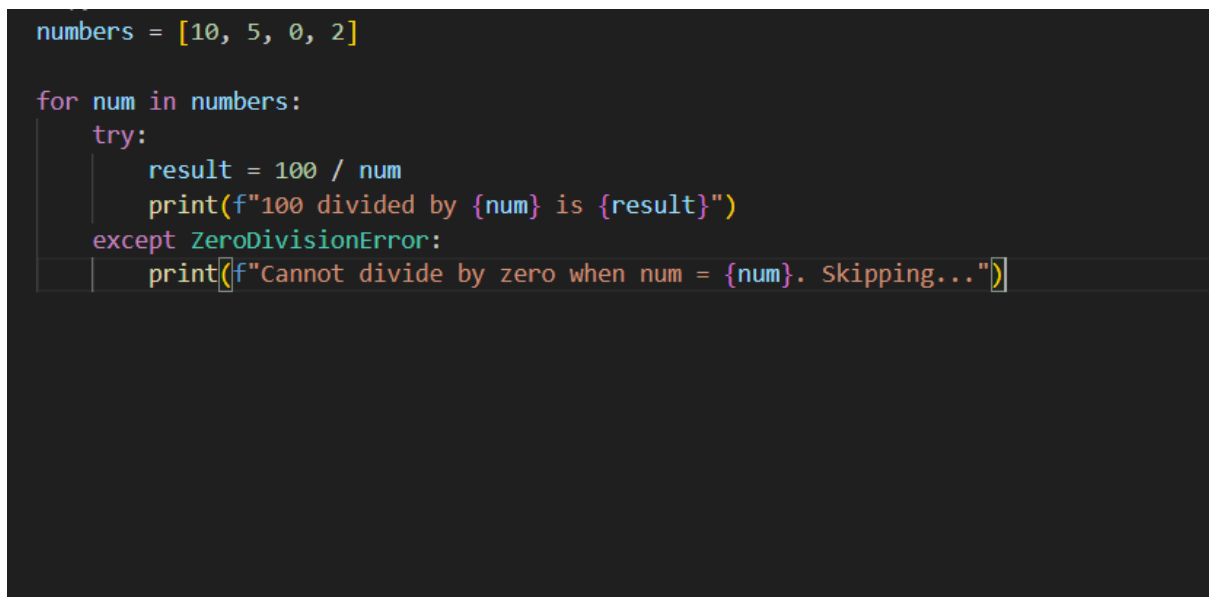
Expected Outcome #4:

- Copilot adds a `try-except` block around the risky operation, preventing crashes and printing a meaningful error message.

BUGGY CODE:



CORRECTED CODE:



OBSERVATION:

There is no Error Handling.

Poor User Feedback: No indication of what went wrong or which value caused the issue.

Try Except block added: isolates risky operation and catches the specific error.

Improved Feedback: Prints a clear message when an error occurs, aiding debugging and user understanding.

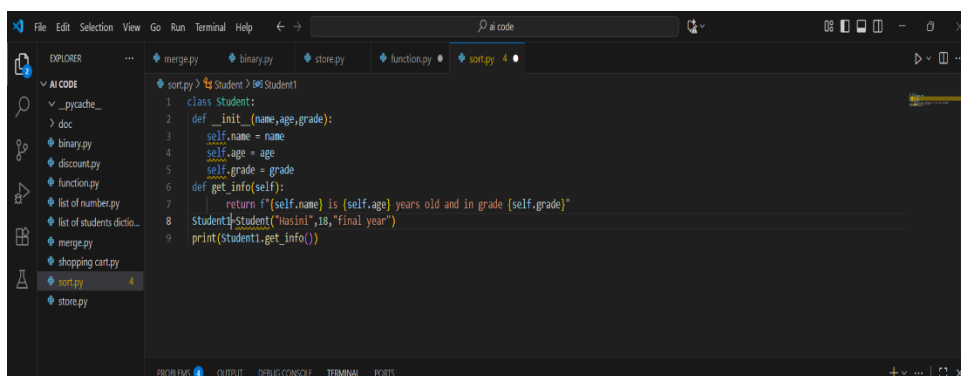
Task Description #5:

- Include a buggy class definition with incorrect `__init__` parameters or attribute references. Ask AI to analyze and correct the constructor and attribute usage.

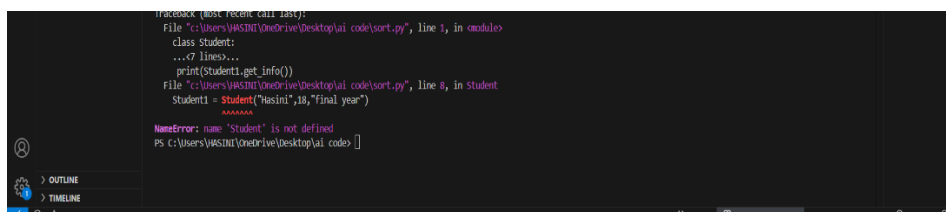
Expected Outcome #5:

- Copilot identifies mismatched parameters or missing self references and rewrites the class with accurate initialization and usage.

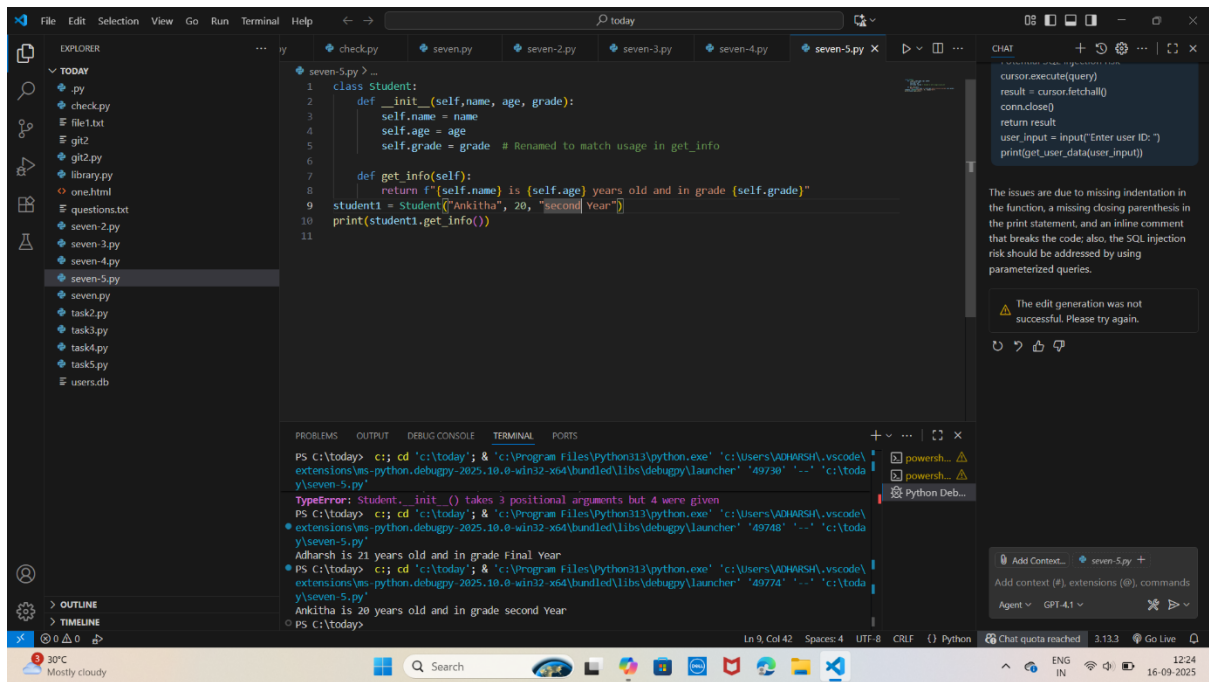
BUGGY CODE:



```
1 class Student:
2 def __init__(name,age,grade):
3     self.name = name
4     self.age = age
5     self.grade = grade
6 def get_info(self):
7     return f'{self.name} is {self.age} years old and in grade {self.grade}'
8 Student1=Student("hasini",18,"final year")
9 print(Student1.get_info())
```



```
Traceback (most recent call last):
  File "C:\Users\VASINI\OneDrive\Desktop\ai code\sort.py", line 1, in <module>
    class Student:
      ...7 lines...
    print(Student1.get_info())
  File "C:\Users\VASINI\OneDrive\Desktop\ai code\sort.py", line 8, in Student
    Student1 = Student("hasini",18,"final year")
              ^^^^^^^
NameError: name 'Student' is not defined
PS C:\Users\VASINI\OneDrive\Desktop\ai code>
```



OBSERVATION:

- Missing self in `__init__` parameters: Python requires self as the first argument in instance methods to refer to the object itself.
- self is the reference to the current instance—required in all instance methods.

